

CALLIDUS TECHNOLOGIES

Flares

Industry Leader / Compliance Driven / Certification Assured



MULTIPOINT



**TOTALLY
ENCLOSED
GROUND FLARE**



INTERNAL STEAM



**MULTIPOINT
STEAM ASSIST**



**CALLIDUS
TECHNOLOGIES, L.L.C.**
The Environmental & Combustion Experts.

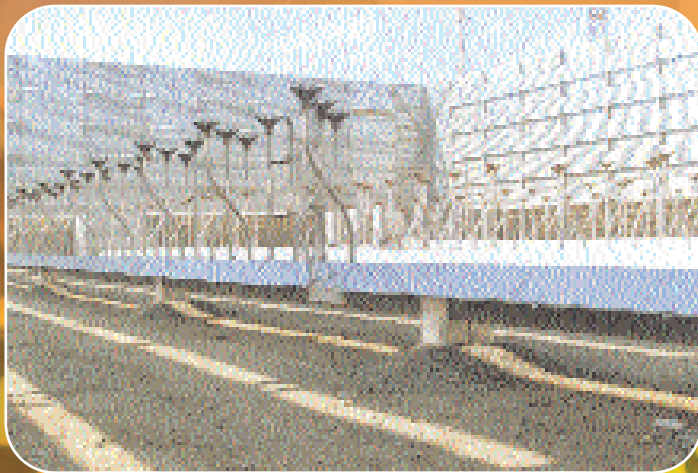
Internal Steam Flare

- Cast 310SS internal tube segments
- Improved air inspiration
- Optimum tube density
- Low noise
- Innovative muffler assembly
- High smokeless capacity
- Plug welded brackets
- Energy efficient pilots
- Extremely stable pilots
- Venturi inlet at steam ejectors



Internal Steam Flare

Multipoint Flare System



Self supported upper steam flare

Callidus-Experts In Flares And Flare Systems

Callidus Technologies has developed flares and flare systems for hydrocarbon processing, oil and gas production, steel, carbon black, and the petrochemical processing industry. Each of these flare systems is built to match the customer's specific process criteria and performance requirements. Through our engineering expertise, manufacturing capabilities and worldwide service, Callidus has become a leader in flare technology. The Callidus team has hundreds of years of experience in the design of flare systems and has been involved in the design, fabrication, and start-up of thousands of flare systems worldwide.

We Pride Ourselves On [Quality]

Our manufacturing facility complies with the highest quality standards in the industry. Many of our own internal quality assurance programs require higher performance standards than some industry certifications.

Our manufacturing techniques use state-of-the-art equipment and our employees are highly trained for their specialized tasks. Ongoing training is regularly scheduled through our research and development group to ensure that the highest level of quality and performance is maintained for each project.

Callidus quality assurance personnel thoroughly inspect each flare system prior to shipment reducing installation time. Callidus project execution and manufacturing is certified ISO 9002.

Callidus [Leads] The Way With Engineering Excellence

Callidus is committed to providing the highest quality engineered products in the combustion industry. We focus on supplying a custom designed solution for every project, based on the customer's individual requirements.

Callidus Has A [Flare To Match] Your Application

Callidus Technologies strives to offer a comprehensive array of flares and flare systems. Our products include:

- Pipe flares
- Multipoint smokeless flares
- Steam assist smokeless flares
- Low-noise steam flares
- Totally enclosed ground flares
- Gas assisted flares
- Air assisted flares
- Pit burners
- Portable flares
- Offshore flares
- Production flares
- Rental flares

[Internal] Steam Flare

The BTZ-IS (Internal Steam) Flare is a dramatic improvement over the traditional internal steam design. The Callidus BTZ-IS Flare offers Internal steam tubes manufactured with cast 310 SS segments at the top preventing tube cracking and warping. The steam tube configuration has improved air inspiration supplied by a venturi inlet at the steam injector. Computer aided design has improved tube placement for optimum tube density and an innovative muffler assembly results in minimum air flow restriction with maximum noise reduction.

The Callidus BTZ-IS Flare configuration is a single point steam assisted flare tip incorporating a multiple internal steam injection system. This flare tip design generates lower noise levels and high smokeless capacities.

Callidus Advantages:

- Highest possible smokeless rates
- Plug welded brackets
- Superior manifold connection
- Lowest measured noise level
- Lowest steam usage

At Callidus We Don't Just Follow The Standards - We Set The Standards

Burners • Flares • Vapor Control Systems • Rotary Kilns • Thermal Oxidizers

[Air] Assisted Flare

The Callidus BTZ-AA (Air Assisted) Flare is an effective alternative to traditional steam assisted smokeless flares. The advantages of our air assisted flare design over steam is the dramatic reduction in maintenance of the flare tip and lower operating costs.

The Callidus design positions the air blower near grade allowing “on-line” maintenance of the smoke suppression system. In addition, the continual flow of forced draft air cools the tip and prevents flame pull down in high wind conditions. Callidus has supplied BTZ-AA flares with capacities of over 250,000 lbs/hr smokeless with a total release of 1,500,000 lbs/hr.

The BTZ-AA flare utilizes a coaxial placement of air ducts surrounding the internal waste gas riser. Key to the flare design is the extremely stable pilot system which has been tested in hurricane wind conditions with rainfalls equal to over 100 inches per hour. The pilot system incorporates a windshield, strainer and a true premix burner capable of firing in 0% oxygen environments at the pilot tip ensuring stable operations. The pilot is coupled with a high stability flame retention system to ensure stable burning up to MACH 1.0 exit velocities.

Callidus Advantages:

- Small profile pilot
- Plug welded brackets
- Low noise
- Low operating costs
- High smokeless capacities

Callidus Air-assisted flare system



Upper [Steam Flare]

The BTZ-US (Upper Steam) flare incorporates a highly stable pilot and flame retention system with a high efficiency, low noise steam injection ring. The Callidus design utilizes multiple steam orifices to control and reduce steam injection noise. Another key to the design is the pilot system which has been tested in hurricane wind conditions with rainfall equal to over 100 inches per hour. This true premix pilot is capable of firing in 0% oxygen environment ensuring stable operations.

The flame retention system design is matched to the pilot system creating a stable burn environment up to MACH 1.0 exit velocities.

[Pipe] Flares

The BTZ-PF (Pipe Flare) incorporates several key design features which ensure a stable burning flare designed for long life and dependable service. The pilot is coupled with a high stability flame retention to ensure stable burning up to MACH 1.0 exit velocities. The flame retention segments ensure stable burning during all weather conditions. This feature allows the use of smaller flares, greatly increasing flare life as it decreases operating costs.

Callidus Advantages:

- Small profile pilot
- Plug welded brackets
- Long service life
- Extremely stable pilots



Upper steam flare

Air Assisted Flare

- Low maintenance
- Long service life
- Low operating costs
- No steam lines to run
- High smokeless capacity
- Low noise design available
- Plug welded brackets
- Energy efficient pilots
- Online maintenance of smoke suppression equipment
- Extremely stable pilots

Upper Steam Flare

- Low noise steam ring
- Plug welded brackets
- Extremely stable pilots
- Superior manifold connection
- Smokeless burning with lower noise
- Mechanically superior design
- High stability flame retention ring
- Lower pressure drop or higher flow at a given pressure



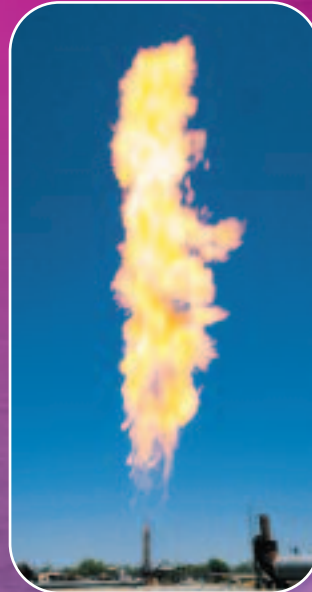
Pipe flares ready for shipping to customer location

Pipe Flares

- High stability flame retention system
- Extremely stable pilots
- Long service life
- Energy efficient pilots
- Reliable pilot ignition systems
- Plug welded brackets

Multipoint Flare System

- Unique burner design provides high surface to area relationship
- Unlimited smokeless capacity
- Extremely stable pilots
- Easy maintenance-all equipment at grade
- Low radiation and no radiation designs available
- Cast stainless steel burners
- Infinite turndown staging system
- Extremely long life burners



Production flare

Production Flare

- Low radiation over wide range
- Choice of four advanced technologies to match individual requirements
- Long service life
- Low weight
- High smokeless capacity
- Short boom length/less boom weight
- Extremely stable pilot
- Cast 310SS burners

Totally Enclosed Ground Flare

- Easy, on-line maintenance
- Sole source systems including installation
- Skids 100% pre-wired, pre-piped, assembled and tested
- Flame finder technology
- Smokeless combustion
- Very low noise levels
- No radiation outside the combustor
- Reduced emissions

*Totally enclosed
ground flare*



[Production] Flare

Callidus has developed a wide range of production flare technologies for the oil and gas production industry. Our innovations have resulted in the development of flares that produce low heat radiation levels at all flow rates with dramatic reduction in flare tip weight.

Through our client driven research and development programs, the Callidus flare group, has developed four distinct production flare technologies each one with its own advantages.

- The EXPERT - This proprietary tip design is coupled with extended periphery devices to produce a high flow, low heat radiation flame.
- The I.V. - This flare tip design produces an extremely short, low heat radiation flame.
- The MOUSE - This product group of flares utilizes a variable topographic principle to produce increased mixing resulting in increased smokeless capacity.
- The DASS - This proven offshore technology design uses a supersonic flare nozzle that produces low radiant heat levels at high release rates.

In addition, the Callidus FROG flare product line offers a complete selection of low pressure flare tips. These flares have the ability to dispose of high molecular weight gases smokelessly, at low pressures without the use of steam or expensive air induction equipment.

All burners use stainless construction and CK-20 investment cast nozzles that operate well at low flow/purge conditions with dramatically extended flare tip life.

The extremely stable pilot system has been tested in hurricane wind conditions with rainfalls equal to over 100 inches per hour. The pilot system incorporates a windshield, strainer and a true pre-mix burner capable of firing in 0% oxygen environments at the pilot tip ensuring stable operation.

Callidus Advantages:

- Low radiation levels
- Light weight
- Short flare boom
- Short rigid flame
- Smokeless flaring
- High stability pilots

Totally [Enclosed] Ground Flare

The BTZ-TEGF (Totally Enclosed Ground Flare) was developed by Callidus to burn flare gases with minimal environmental impact. The flame burns completely concealed from view with no smoke, very low noise, reduced emissions and no radiation outside the combustor.

The BTZ-TEGF flare utilizes a refractory lined combustor with highly efficient burners. Most equipment is located near grade for easy and on-line maintenance. Both forced-draft and natural-draft systems are available.

The Callidus engineering team has been involved in the design of enclosed flares since 1974. Our experience provides a one stop source for enclosed flares from vapor inlet to combustor stack. Callidus enclosed flares are available completely skid mounted, pre-wired, pre-piped, and tested. Applications include truck, marine, and rail car terminals, landfill/biogas, production onshore and offshore (FPSO), refining, and petrochemical plants.

[Multipoint] Flare System

The BTZ-MP (Multipoint) Flare System is the result of over 20 years of work in the development of multipoint flare designs. Callidus' unique burner system develops significantly higher surface to area relationships for the waste gas exit. This feature provides more air inspiration and greater turndown capability.

Multipoint flares offer unlimited smokeless capacity and the lowest possible radiation. Reductions in thermal radiation levels of 60% or greater are often achieved. Callidus MP burners are high quality stainless steel castings with thicker metal cross sections, longer life, better waste gas flow patterns and lower internal pressure drops. These high quality castings also dramatically reduce the potential of cracking. Callidus MP Flares are in service both onshore and offshore, with smokeless capacities in excess of 3,000,000 lbs/hr.

Callidus Advantages:

- Lower pressure drop or higher flow at a given pressure
- Plug welded brackets
- High quality cast stainless steel burner
- Longer burner life

[Flare] Test Facility

The Callidus flare test facility is in continual use for flare technology research and development as well as customer witnessed demonstrations. Our array of test flares and flare systems allows us to closely match actual field operating conditions, providing results which will accurately predict the measured performance of flares installed in the field.

Our Beggs, Oklahoma testing facility features the following:

- Flare School Classroom
- State-of-the-art Data Acquisition System
- Excess of 600,000 lb/hr (300 mmscf) capacity
- Online noise spectrum analysis
- Online radiation analysis

[Unequaled] Research and Development

Our industrial scale research center is a fully instrumented and computerized facility totally devoted to research and development of new product improvements, new combustion processes, and problem solving applications. Our R&D center also serves as a test center for regulatory agencies as well as private clients. The test center has the capability to fully test and provide reports on all types of flare configurations. The Callidus test facility investment underscores our commitment to being the leader in the combustion industry.

[Advanced] Manufacturing and Fabrication Capabilities

Upgrading our manufacturing and fabrication operation is an ongoing process at Callidus Technologies. Our current facility occupies over 30,000 sq. ft. consisting of the latest manufacturing techniques and equipment. As a world player in the flare market, much of our fabrication takes place around the world in strategic locations. Proprietary items are fabricated at our U.S. facility. This "satellite" approach makes good economic sense assuring that the customer gets the absolute best equipment for their installation.

We [Exceed] The Expected

At Callidus, quality assurance is everyone's job. Every step of the project is consistently reviewed to make sure that we live up to the expectations of our customers. Where applicable, each piece of equipment is pre-assembled and tested to assure performance. All machining and fabrication of critical components are accomplished in-house or by trusted experienced suppliers. Our rigorous quality inspection program is underscored by our ISO9002 certification.

Callidus Technologies offers the best in design, quality, performance and delivery



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